

WHAT IS CLAIMED IS:

1. An austenitic stainless steel which comprises, on the percent by mass basis, C: 0.03 - 0.12 %, Si: 0.2 - 2 %, Mn: 0.1 - 3 %, P: 0.03 % or less, S: 0.01 % or less, Ni: more than 18 % and less than 25 %, Cr: more than 22 % and less than 30 %, Co: 0.04 - 0.8 %, Ti: 0.002 % or more and less than 0.01 %, Nb: 0.1 - 1 %, V: 0.01 - 1 %, B: more than 0.0005 % and 0.2 % or less, sol. Al: 0.0005 % or more and less than 0.03 %, N: 0.1 - 0.35 % and O (Oxygen): 0.001 - 0.008 %, with the balance being Fe and impurities.

2. An austenitic stainless steel which comprises, on the percent by mass basis, C: 0.03 - 0.12 %, Si: 0.2 - 2 %, Mn: 0.1 - 3 %, P: 0.03 % or less, S: 0.01 % or less, Ni: more than 18 % and less than 25 %, Cr: more than 22 % and less than 30 %, Co: 0.04 - 0.8 %, Ti: 0.002 % or more and less than 0.01 %, Nb: 0.1 - 1 %, V: 0.01 - 1 %, B: more than 0.0005 % and 0.2 % or less, sol. Al: 0.0005 % or more and less than 0.03 %, N: 0.1 - 0.35 %, O (Oxygen): 0.001 - 0.008 % and one or more element(s) selected from a group of Mo and W of 0.1 - 5 % in single or total content, with the balance being Fe and impurities.

3. An austenitic stainless steel which comprises, on the percent by mass basis, C: 0.03 - 0.12 %, Si: 0.2 - 2 %, Mn: 0.1 - 3 %, P: 0.03 % or less, S: 0.01 % or less, Ni: more than 18 % and less than 25 %, Cr: more than 22 % and less than 30 %, Co: 0.04 - 0.8 %, Ti: 0.002 %

or more and less than 0.01 %, Nb: 0.1 - 1 %, V: 0.01 - 1 %, B: more than 0.0005 % and 0.2 % or less, sol. Al: 0.0005 % or more and less than 0.03 %, N: 0.1 - 0.35 %, O (Oxygen): 0.001 - 0.008 % and one or more element(s) selected from a group of Mg of 0.0005 - 0.01 %, Zr of 0.0005 - 0.2 %, Ca of 0.0005 - 0.05 %, REM of 0.0005 - 0.2 %, Pd of 0.0005 - 0.2 %, and Hf of 0.0005 - 0.2 %, with the balance being Fe and impurities.

4. An austenitic stainless steel which comprises, on the percent by mass basis, C: 0.03 - 0.12 %, Si: 0.2 - 2 %, Mn: 0.1 - 3 %, P: 0.03 % or less, S: 0.01 % or less, Ni: more than 18 % and less than 25 %, Cr: more than 22 % and less than 30 %, Co: 0.04 - 0.8 %, Ti: 0.002 % or more and less than 0.01 %, Nb: 0.1 - 1 %, V: 0.01 - 1 %, B: more than 0.0005 % and 0.2 % or less, sol. Al: 0.0005 % or more and less than 0.03 %, N: 0.1 - 0.35 %, O (Oxygen): 0.001 - 0.008 %, one or more element(s) selected from a group of Mo and W of 0.1 - 5 % in single or total content and one or more element(s) selected from a group of Mg of 0.0005 - 0.01 %, Zr of 0.0005 - 0.2 %, Ca of 0.0005 - 0.05 %, REM of 0.0005 - 0.2 %, Pd of 0.0005 - 0.2 %, and Hf of 0.0005 - 0.2 %, with the balance being Fe and impurities.

5. An austenitic stainless steel excellent in high temperature strength and creep rupture ductility according to any one of claims 1 to 4, wherein the microstructure of the said steel is a uniform grain structure having the ASTM austenitic grain size number

of 0 or more and less than 7 and the mixed grain ratio of 10 % or less.

6. A method of manufacturing an austenitic stainless steel excellent in high temperature strength and creep rupture ductility according to claim 5 comprising the steps of, before hot or cold final working of a steel having chemical compositions according to any one of claims 1 to 4, heating said steel to 1200 °C or more at least once, and subjecting the steel to a final heat treatment at 1200 °C or more and at a temperature, which is 10 °C or more higher than the final working end temperature when the final working is hot working, or subjecting the steel to a final heat treatment at 1200 °C or more and at a temperature, which is 10 °C or more higher than the final heating temperature in said at least once heating when the final working is cold working.